

DRAWINGS ATTACHED

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IMPROVED DISPENSING DEVICES FOR USE WITH OR INCLUDING AEROSOL DISPENSING CONTAINERS

(71) We, RITA LABORATORIES INC., a Corporation organized and existing under the laws of the State of Delaware, United States of America, 1901 Northford Street, Northridge, California, United States of America, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, as embodied in the following claims and in the following description:

This invention relates to a dispensing device which is particularly suited for dispensing and administering aerosol sprays of fluids. The principal use for such a device is in dispensing aerosol sprays of fluids, for example, for use in a medical or dental office.

The invention provides a dispensing device which is constructed with an aerosol dispensing container charged with a self-propelling liquid composition, and equipped with a metering valve including a valve stem driven with a discharge tube, and a valve stem is mounted for movement relative to the container between an open charging and an open discharging position for said metering valve and comprising: a housing for receiving said container for dispensing of said container within said housing, said housing including a support member having an opening for receiving said discharge tube and providing a discharge passage for said valve stem carried in said housing for urging said container toward said support member and said valve toward said discharging position, the spring means being compressible to a closed position permitting movement of said valve to said discharging position and movement of said container away from said support member; a latch for locking said spring in said closed position; and a trigger for urging said latch to return said spring to urge said valve to said discharging position.

According to a feature of the invention said spring means is positioned at the end of said housing opposite said support member, and the

dispensing device includes manually actuable means for applying a force to said container for compressing said spring to said closed position.

The manually actuable means may include a first and second portion of said housing movable relative to each other, with said support member in said first portion and said spring to be particularly defined in and by the following description:

According to another feature of the invention, there is manually actuable means for compressing said spring means to said closed position, and said latch incorporating bias means urging the latch to the locking position.

In one form said housing includes means defining an air passage through said housing, and in which said movable element comprises a bellows-like member slidable in said air passage and movable through to engage and trip said latch, with a pressure differential in said air passage across said element producing such movement.

In this form the air passage may include a tubular section, with said latch extending in said tubular section adjacent one end thereof, and in which said movable element comprises a bellows-like member slidable in said tubular section to impact said latch under the influence of the pressure differential.

Alternatively said movable element may comprise a valve disposed in and substantially blocking said air passage, with a pressure differential moving said element to trip said latch.

According to yet another feature of the invention there is a locking means movable between locked and unlocked positions, and said latch is locking said spring means in said closed position, with said locking means disengaged when in said locked position to engage said latch blocking the tripping element.

tion, bringing the lever 39 into the housing of the lever 32. The compressed charge of material within the housing 32 is discharged through the tubular end 38 of the valve.

With the upper portion 22 of the housing removed, the container 20 is positioned in the lower portion 23, with the tubular end 38 of the valve stem entering a support member 43 projecting upward from the bottom of the housing. A discharge passage 44 is provided in the member 43 for communication between the valve and the container 43 of the housing. This 44 may be provided in the lower portion 23 of the housing for opening the container from the housing providing an air passage around the container. The container may be partially but not necessarily removable and replaceable.

A spring system is carried in the upper portion 23 of the housing for engaging the container 20 and urging the container downward in the discharging position of Figure 2. The spring system is shown in Figure 1 and 2 and includes a moving element 47 and a fixed element 48 with springs 49, 50 carried in the member 43 and engaging the fixed element 48. A latch lever 51 is pivotally mounted to the fixed element 48 at a pin 52 and includes a hook 53 for engaging a notch 54 of the moving element 47 (Figure 3). A coil spring 55 disposed between the latch lever 51 and the fixed element 48 urges the lever toward the locking position.

An arm 60 of the latch lever 51 projects through an opening 62 of the housing into a tubular passage 63, the passage 63 partially being enclosed as a part of the upper portion 22 of the housing (Figure 1). The upper end of the passage 63 is closed by a plug 64 and a metering valve 65 is positioned across the lower end of the passage. A trigger member 66 is positioned in the passage 63 and a pressure differential across the trigger member 66, caused by the trigger member 66, causes the trigger member to fly upward and beyond the arm 60 of the latch lever 51, as shown in chain 60 of the latch lever 51, as shown in chain 60 of the latch lever 51. This impact trips the latch lever and releases the moving element 47. The compressed springs 49 and 50 act through the moving element 47 to move the container 20 downward from the position of Figure 4 to the position of Figure 3, discharging the material from the container 20 through the passage 44 into the container 43 for introduction by the patient, thereby completing the cycle of operation of the dispensing device.

An alternative form of the dispensing device is illustrated in Figures 10 and 11, with the container 20 carried in a one-piece housing 73 having the general configuration of the housing of the other embodiment. The container is inserted through the open top of the housing with the tubular end 38 of the valve stem entering the support member 43. A spring member 76 typically may be a plastic bellows or so and so forth.

A push rod 80 is slidably positioned in aligned members 81 and 82 of the housing. Levers 83 and 84 are pivotally mounted to the lower end of the push rod 80, with one lever engaging the container 20 and the other lever engaging the bottom of the housing and the support member 43. A latch lever 85 is disposed in the housing for locking the container in the closed position and the latch lever 85 is in the closed position of Figure 11. An air passage is provided through the de-

vice, starting at an opening 82, with a section of relatively large cross-sectional area compared to the balance of the air passage and bounded by a shoulder 86. The passage leads from a chamber 80, and around the support member 43 to the member 43. A pin or lever 87 is carried in the passage between the shoulder 86 and the support member 43. Levers 83 and 84 are pivotally mounted to a lever 87 carried on the lower side of the lever 87, with the lever 87 engaging the housing and the lever 86 pivotally connected to the latch lever 85.

The dispensing device is shown in the discharging position in Figure 11. After discharging, the push rod 80 is manually pushed toward the position of Figure 10 to the position of Figure 10, with the action of the lever 83, 84 moving the container upward and compressing the spring member 76. A reduced alignment with the latch lever 85, permitting movement of the lever 85 to the position of Figure 10, under the action of the action of the lever 83, 84 moving the container upward and compressing the spring member 76. This movement of the lever 85 produces an upward movement of the latch lever 85 to the position of Figure 10, thereby locking the mechanism in the closed position.

The dispensing device is now ready for dispensing a second charge. The patient places the member 43 in his mouth and starts to inhale. The initial inhalation produces a pressure differential across the lever 87, causing the lever 87 to fly upward and beyond the arm 60 of the latch lever 51, as shown in chain 60 of the latch lever 51, as shown in chain 60 of the latch lever 51. This impact trips the latch lever and releases the moving element 47. The compressed springs 49 and 50 act through the moving element 47 to move the container 20 downward from the position of Figure 4 to the position of Figure 3, discharging the material from the container 20 through the passage 44 into the container 43 for introduction by the patient, thereby completing the cycle of operation of the dispensing device.

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member slidable in said tubular section to
prevent said back under the influence of the pres-
sure differential.

8. A device as claimed in claim 6 in which
said movable chamber comprises a valve dis-
posed to seal substantially blocking said air
passage, with a pressure differential moving
said chamber to trip said back.

9. A device as claimed in any one of claims
1 to 7 and including locking means movable
between locked and unlocked positions when
said back is latching said spring in said cocked
position, with said locking means disposed
when in said locked position to engage said
back blocking the tripping thereof.

10. A dispensing device having a housing,
a manual dispensing member carried in said
housing and charged with a self-propelling
liquid composition, metering valve means
carried in said container and movable between
a charging position for receiving a charge from
said container and a discharging position for
dispensing said charge, said housing including
first and second portions slidable relative to
each other, a spring means carried in said
housing between said first portion and said
container for urging said container against said
second portion and said metering valve means
to said discharging position, said first and sec-
ond portions being normally compressible for
compressing said spring means to a cocked po-
sition for the movement of said metering valve
means to said charging position, a back for
latching said spring means in said cocked po-
sition, said housing including means defining an
air passage therethrough with a tubular section,
with said back extending into said tubular sec-
tion adjacent one end thereof, and a trip cham-
ber slidable disposed in said tubular section
to impact said back under the influence of a

pressure differential in said air passage for
tripping said back to release said spring
means, and so urging metering valve means to
said discharging position.

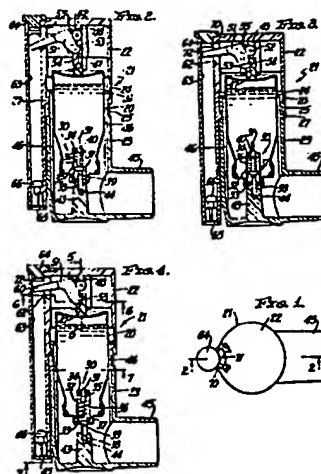
11. A dispensing device having a housing,
a manual dispensing member carried in said
housing and charged with a self-propelling
liquid composition, metering valve means
carried in said container and movable between
a charging position for receiving a charge from
said container and a discharging position for
dispensing said charge, a spring means carried
in said housing for urging said container and
the metering valve means to said discharging
position, a manually accessible push member
carried in said housing and engaging said con-
tainer for urging said container and compress-
ing said spring means to a cocked position for
movement of said metering valve means to
said charging position, a back engaging said
push member for latching said spring means
in said cocked position, said housing including
means defining an air passage therethrough
and a valve member disposed in and substan-
tially blocking said air passage and coupled
to said back, the arrangement being such that
a pressure differential in said air passage
moves said valve member to trip said back and
release said spring means, and so urges said
metering valve means to said discharging po-
sition.

12. A device substantially as hereinbefore
described with reference to and as shown in
Figures 1 to 3, or in Figures 10 and 11 of
the accompanying drawings.

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